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An Informal Letter
of
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BUREAU OF ENTOMOLOGY
FOREST INSECT INVESTIGATIONS
(not for publication)

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FOREST ENTOMOLOGY STILL ENTOMOLOGY
by J.M. Miller

In Person's article in the February issue of this paper he very appropriately introduces the change in emphasis that has come about in our line of attack upon certain problems in Forest Entomology. Instead of devoting our entire attention to finding out what the insects are, how they live and what they do, we are concerned as well with the way in which they fit into the scheme of things in the forest. Through the large sample plot and with various types of surveys we are trying to determine the type of forest and other environmental conditions that are favorable or unfavorable to the beetles. The tree rather than the insect becomes the basis of our attack on the problem.

This shift of perspective, in which entomology becomes primarily a phase of forestry, now offers the most promising developments in the solution of our more important barkbeetle problems. But there is an obvious danger in carrying this line of approach to an extreme. First of all we are still entomologists, and a sound knowledge of the insects, their life histories, distribution and ecology is the first consideration in this science. It is in the application of this information that the title of "forest" entomologist becomes significant.

The purpose of these comments is not to start a discussion of "Why is a Forest Entomologist?" but to emphasize to the field man the necessity of keeping up the systematic collections and note records that figured so prominently in the early work of the Division of Forest Insects. I know that on control projects, and even on our sample plot and brood study work, we are prone to let this activity go by the board. This is largely due to the pressure of recording an immense amount of survey data, and to the fact that the need for insect collections and notes is not obvious at the time. The real advantages of gathering this material usually come later, when we want to check up on some particular point in the study and refer to the note or the original material if necessary.

The "Hopk. U.S." numbered note system, planned by Dr. Hopkins in the early days of the Division, has stood the test of considerable neglect, abuse and flagrant liberties on the part of the field men. It is still possible by this system, even though the notes have been poorly kept, to obtain any worth while information regarding any particular insect in any locality that has been recorded in the system. All the information so kept can be adequately indexed, summarized and made available to any other worker in the group. Such references are really indispensable to the field station files.

The most glaring violations of this system are where field men do not collect at all, or else take a large series of the insects connected with some particular study but fail to enter these or the appropriate data in the numbered note series. The information so recorded is available only to the collector himself, and in time will probably be lost even to him.

Although on some projects it seems best to work with the tools and methods of the forester, it is still part of our job to maintain an orderly accumulation of information about the insects that concern our problems. In doing so let's stick to the system we now have until a better one has been devised and adopted.

THE MOUNTAIN PINE BEETLE IN WESTERN WHITE PINE FORESTS

One can easily recognize the importance of the mountain pine beetle in northern Idaho if, as he travels through our mature white pine forests, he will attribute the many old snags that can be seen along his path to the consequences of insect attack. Our records show us that some fifteen years ago a serious outbreak of the mountain pine beetle occurred throughout the Inland Empire. The loss from this epidemic varied in different regions. Results of actual timber surveys show that in some areas thirty per cent or more of the mature trees have been killed by insects during the past fifteen years. Since that outbreak there has been but a normal or endemic condition. The loss from these normal infestations fluctuated in different years from a few tenths of one per cent to as much as one per cent or more of the total stand.

Are the conditions of 1912 and 1913 to be repeated? Last year's annual ranger reports for District 1 showed some forty-five outbreaks of the mountain pine beetle. Twenty-four of these were reported as increasing and control measures were requested. The other twenty-one were reported to be in a normal, or decreasing, status. Several of these areas have been examined and show a marked increase over the previous year's loss. It is believed that the condition now prevalent in the white pine stands in northern Idaho and western Montana is the most serious that has existed for the past twelve years. Do we dare prophesy that the epidemic of 1912-1913 is to be repeated, and another large section of our remaining white pine forests removed?

J.C.E.

MODOC COUNTY CONCERNED OVER TIMBER LOSSES

The heavy killing of western yellow pine timber by beetles in the Happy Camp area of the Modoc is causing widespread concern. Since 1921 the estimated total volume of merchantable timber killed by beetles, both government and privately-owned, amounted to 506,171,000 feet b.m. The Forest Service estimates that at their minimum stumpage rate this represents a loss of \$1,265,000. In 1927 the loss on government land alone at the same rate is estimated at 73,300 M feet b.m., valued at \$183,250.

The private timber owners, mainly the Pickering Lumber Company and the Red River Lumber Company, are greatly concerned over the situation and at a loss to know what steps should be taken to alleviate it. Their recent appeal to the Secretary of Agriculture and the Forester has brought out the fact that little or no government aid can be expected, as the federal experts feel that the situation has now gone too far to be remedied by any methods that are economically feasible, short of disposing of the mature timber at the earliest opportunity.

More recently this situation has come to the attention of the Modoc County Development Board and the county authorities, who are now wondering just how this heavy insect loss will affect the revenue that the county would derive from the sale of government timber. Since thirty-five per cent of the proceeds of government timber sales go to the county, it is easy to understand why the latter should be alarmed over the present state of affairs.

F.P.K.

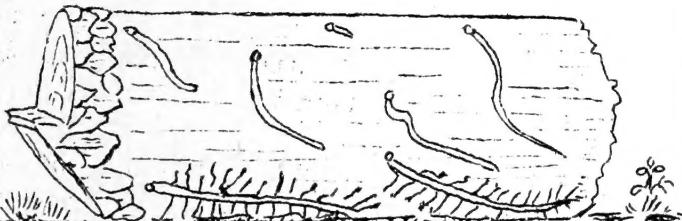
ARE DENDROCTONUS BEETLES CHANGING THEIR HABITS?

Entomologists have long considered the habits of *Dendroctonus* beetles as fixed or unchanging to a marked degree, and hence it is of interest when these beetles react to changed environment to the extent of making their selection of a host under abnormal conditions.

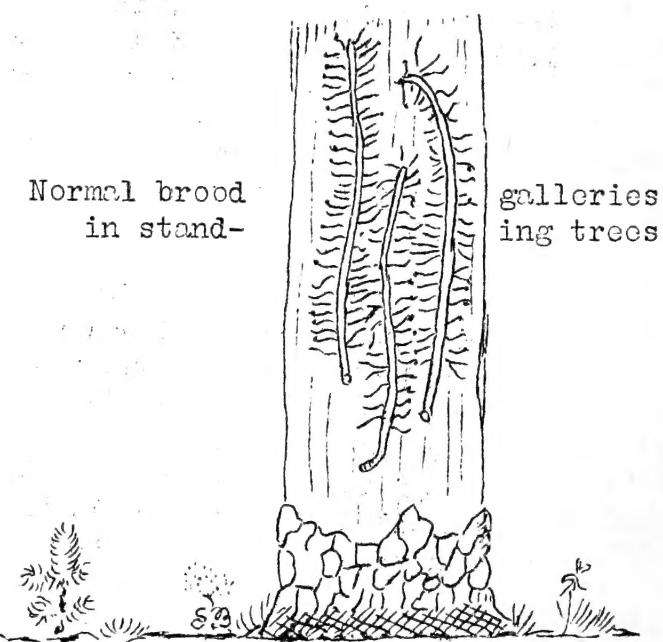
Until recently it was generally believed that the mountain pine beetle (*Dendroctonus monticolae*) would not normally attack felled lodgepole pine trees. This supposed fact was based on the theory that the beetle broods could not successfully develop on down trees, due to the rapid drying out of the thin bark characteristic of lodgepole pine. This was supported by many observations made in a number of localities, and seemed true to the extent that it was believed a fixed habit of this beetle to avoid lodgepole pine slash of all kinds. However, recent investigations have disproved this theory insofar as attack on this material is concerned. They have also shown that this beetle sometimes shows a marked fondness for felled logs in preference to standing trees.

The investigations referred to were carried out in connection with other studies of the mountain pine beetle in the Crater National Forest, southern Oregon, during the summer of 1927. Early in July a number of lodgepole pine trees were felled to attract *Ips oregoni* in an experiment for testing the repellent action of various sprays. Within a few days after the trees were felled it was found that they were being attacked by the mountain pine beetle. That these attacks on the felled logs were not sporadic or accidental but showed concerted action by the beetles to infest the slash fully, was evidenced by the large numbers of beetles that attacked the logs and also by the fact that no standing trees in the vicinity of the slash were attacked. Since these attacks were rather surprising in view of previous observations on the habits of this beetle in lodgepole pine infestations, they were given particular attention.

Typical brood galleries
in felled logs



Normal brood
in stand-



galleries
ing trees

The first set of trees felled, twenty-five in number, were all attacked within six days. Since these trees were not limbed nor topped they were comparable to windfalls and other natural slash. As in the case of attacks on standing trees, the beetles attacked the logs from the butt to within ten to fifteen feet of the top. Attacks were made on the entire circumference of the logs, although they were concentrated along the sides near the ground and scattered on the more exposed top and upper sides. To test further this apparent tendency of the beetles to select felled logs, another set of twenty-five trees was felled two weeks later with the same result. All the trees of this second set were attacked soon after felling although, as in the preceding test, no adjacent standing trees were attacked.

The development of a large number of the broods in these logs was normal during the early stages, although none of them reached maturity owing to the early drying-out of the inner bark. The majority of the adults which attacked the top and upper sides of the exposed portions of the logs were killed by the intense heat of the sun's rays before the egg galleries were extended beyond the initial stage. The broods that developed from the successful attacks on the under side of the logs attained the half-grown-larva stage before dying. These broods succumbed in late August, about five weeks after the eggs were laid.

The only successful attacks made on the upper sides of the logs were those in which the adult beetles curved the egg galleries down the sides of the logs at a sharp angle from the usual direction, which is parallel with the bole of the tree. This aberration from the normal habit evidently resulted from the beetles' attempt to get away from the high temperatures in the bark where the entrance holes were made. Very few of these galleries were completed, because of the early death of the parent beetles as a result of the high bark temperatures. The diagram illustrates the characteristic curve of these galleries compared to normal ones in standing trees.

These observations show that the mountain pine beetle will attack lodgepole pine slash, and in one instance indicated a marked preference for it. However, full development of the broods was prevented in this material, due to the early drying out of the bark. J.E.P.

PINON PINE ON SAN BERNARDINO FOREST SUFFERS HEAVILY FROM INSECT ATTACK

Last year a number of reports were received telling of the extensive killing of pinon pine (Pinus monophylla) in the San Bernardino Mountains, Calif. Since we had no previous record of outbreaks of insect attacks on this tree, Keen stopped off on returning from his annual leave to determine the cause of the trouble. In company with County Forester Tuttle an examination was made of the area near Baldwin Lake. Ips confusus was found to be the culprit, having killed groups of pines an acre or more in extent. Like other Ips outbreaks the infestation appeared to have subsided suddenly, and only a few newly-infested trees could be found.

F.P.K.

SPRUCE BUDWORM IN DISTRICT 1

The spruce budworm, which for many years had been considered the exclusive property of eastern forests, in 1922 was reported in the west at Priest Lake, Idaho. Later in the season it was found to be in epidemic form in central Idaho, and the following year a severe outbreak that had been in existence for three or four years was located within Yellowstone National Park. Since that time the insects have spread throughout the states of Idaho and Montana, and there are now twenty-one outbreaks within nine of the national forests in District 1. A conservative estimate taken from the rangers' annual reports of the district would place the infested area at approximately 784,400 acres. This acreage would be greatly increased if the southern portion of Idaho (District 4) were included. There is no doubt that a large percentage of the timber within this area will be destroyed as a result of the defoliation. The damage is greatest in pure stands of Douglas fir, though practically all species of conifers within the district are more or less severely attacked.

What is the future of this epidemic? Will the catastrophe that occurred in Maine and Canada be repeated in our northwestern states? Will this epidemic reach the pure Douglas fir stands of Oregon and Washington, and if so, who can foresee the results?

J.C.E.

TORREY PINES AND INSECTS

In the distant past Torrey pines probably covered all the hills along the coast of southern California. Now only a few specimens struggle for existence near San Diego and on Santa Rosa Island of the Santa Barbara group. However, their decline can hardly be attributed to insects, since they are apparently very free from attack by these well-known pests.

In December 1927 Keen examined the San Diego groves and was unable to find a single dying tree. Broken branches were heavily infested with the Torrey pine twig beetle (Pityophthorus torreyanae Sw.), and the dead wood of branches was infested with weevils (Rhyncolus dorsalis) and termites (Kalotermes minor (Hagen)). The work of wood-boring cerambycids and buprestids was also commonly found, but the beetles themselves were not collected.

F.P.K.

A FEW FIGURES RELATIVE TO THE MOUNTAIN PINE BEETLE IN LODGEPOLE PINE

These data were secured chiefly from about sixty-five untreated trees that were studied as checks against control experiments during the season of 1927. Most of the figures are in terms of a square foot of inner bark surface.

Gallery length per square foot -	68.6"
Average gallery length - - - -	9.3"
Attacks per square foot - - - -	7.4
Number of insects per attack - -	2.0
Eggs laid per square foot - - -	358.7
Eggs laid per foot of gallery -	62.8

A.L.G.

PACIFIC COAST ENTOMOLOGISTS RECEIVE HIGH HONORS

At the annual meetings held the last of the year, two Californians were elected presidents of the two great American entomological societies. Professor W.B. Herms of the University of California became head of the American Association of Economic Entomologists, and Professor E.O. Essig of the same institution, president of the Entomological Society of America.

Professor Herms is noted for his work on medical entomology and parasitology, and Professor Essig for his "Injurious and Beneficial Insects of California" and "Insects of Western North America".

"CABLE BORER" CAUSES TROUBLE TO TELEPHONE LINEMEN

A little black bug with a propensity for boring holes in the sheaths of telephone cables is causing telephone line trouble in various sections of California. The tiny holes made by the insect allow moisture from the first rains to reach wires inside aerial cables and short-circuit the wires. Some say that this bug's correct name is Scobicia declivis Lec., but telephone men, among other appropriate designations, call it simply the "cable borer".

The cable borer made its debut on the California coast a number of years ago, and proves to be a perennial pest when winter comes. Its work this year is most evident in Monterey, Santa Cruz and San Luis Obispo Counties. Recently more than three hundred telephone lines in Salinas were out of commission with the first heavy rain. The telephone company had anticipated trouble, however, and before nightfall every "short" had been repaired.

A.W. Marsch, manager for the Pacific Telephone and Telegraph Company in Salinas, collected a vial of the bugs and displayed them in his office. It was found in one case that over thirty of the insects were thriving in one small piece of telephone cable. While it is not definitely known that the borer eats the particles of lead and antimony alloy resulting from its operations, there is ample evidence that it relishes the wood poles in which it is also found. It is reported that newspaper men were inclined for some time to classify the cable borer in the same category with "type lice"; but with the exhibition of actual specimens to Salinas editors all doubt has been dispelled in this connection.

MAYFIELD (CALIF.) NEWS.

FOREST ENTOMOLOGIST OF NEW ZEALAND DESires POSITION IN AMERICA

Captain J.S. Phillips of Wellington, New Zealand, wishes to move to America. Captain Phillips is thirty-two years of age and a forestry graduate of Oxford University, where he specialized in forest entomology. He is now doing forestry work in New Zealand but would like to come to the United States. His address is Victoria University College, Wellington, New Zealand.

DETAILED TO WASHINGTON OFFICE

J.M. Miller of the Palo Alto Laboratory and J.C. Evenden of the Coeur d'Alene Station left the latter place for Washington on February 24. They expect to spend the month of March in the Nation's capital considering plans for the coming field season and working up data for the Forest Protection Board.

Before leaving for Washington, Miller and Evenden attended the annual convention of the Western Forestry and Conservation Association, held at Tacoma, Wash., on February 20, 21 and 22.

FOREST INSECTS AT NATIONAL PARK CONFERENCE

The annual conference of national park superintendents and other officials was held at San Francisco and Berkeley, Calif. February 14-21, and two days were devoted to forestry problems. Miller, Burke, Keen, Patterson and Person represented the Bureau of Entomology, Burke delivering a paper on "Insect Problems in the National Parks". As most of the superintendents have had direct contact with forest insect problems in their various parks they fully appreciate the importance of the study and control of destructive forest insects.

H.E.B.

STATION VISITORS

Mr. Theo. H. Scheffer, Associate Biologist of the U.S. Biological Survey, visited the Palo Alto Laboratory during February. Mr. Scheffer is making a study of the rodents injurious to bulbs.

Mr. Willis W. Wagener, Assistant Pathologist of the U.S. Bureau of Plant Industry, called at the laboratory early in February in regard to the photographing of Monterey cypress on the Stanford University grounds which is dying from an infection of a new species of Coryneum.

Mrs. Sarah E. Bushey, formerly clerk at the Palo Alto Laboratory, was recently a station visitor. Since leaving the bureau work Mrs. Bushey has been very ill, and the office force were glad to see her in good health once more. She is now living in Napa, Calif.

It was a pleasure to see F.B. Herbert and R.D. Hartman, two former members of the Palo Alto staff, during the past month. Both looked prosperous and happy. Herbert is still with Balfour, Guthrie & Co. at Los Gatos, while Hartman is president of the Leonard Coates Nursery Co. of San Jose.

PERSONNEL HAPPENINGS

Professor W.J. Chamberlin of the Oregon Agricultural College is now at Stanford taking work toward his Ph.D. degree. Chamberlin is located next to the Forest Insect Laboratory, and it goes without saying that we have many discussions on forest insects.

Associate Entomologist W.D. Edmonston has been transferred from Tucson, Ariz., to Palo Alto. Edmonston is working on life history charts of forest insects and will cooperate in the national park work of the bureau. He is taking over the art work for the NEWS LETTER, and is responsible for our attractive title page and other embellishments. We are glad to welcome Mr. and Mrs. Edmonston to Palo Alto.

Senior Scientific Aid Al Wagner of the Northfork (Calif.) Laboratory has been transferred to Palo Alto for the winter to work on freezing experiments with the western pine and mountain pine beetles.

Senior Scientific Aid W.J. Buckhorn, who started with the bureau in 1922 on the Southern Oregon-Northern California Control Project, resigned December 26 to take up aviation. "Buck" spent three months last winter at an aviation school in Kansas City, and is now completing his training. The latest reports say that he has purchased a plane, is agent for eastern Oregon, and that it is a case of "fly or die". We join his many friends in hoping that it is "fly".

Mrs. Sarah E. Bushey, assistant clerk with the Palo Alto Laboratory since December 1, 1925, resigned December 31 last. A great deal of the hard work on our WESTERN FOREST INSECT NEWS was done by Mrs. Bushey, and she was responsible for nearly all our art efforts, as well as the mimeographing and mailing. Her energy and strict attention to the work in hand made it a pleasure to work with Mrs. Bushey. The entire force of the laboratory wish her every success and happiness at her new home in Napa, Calif.

Miss Dorothy Herdman and Mr. Fred A. Bianchi, students of Stanford, have been appointed respectively junior scientific aid and field assistant, and assigned to the Palo Alto Laboratory for work on files and collections.

CURRENT LITERATURE

BELL, J.A. The Development of the Proventriculus of Pityogenes hopkinsi Swaine; Ann.Ent.Soc.of Amer., Dec.1927, pp. 522-539, figs.1-17. A very complete account of methods used and results obtained in studying the development of this species.

BURKE, H.E. The Western Cedar Pole Borer or Powder Worm; Tech. Bul.48, USDA, Feb.1928, pp.1-15, figs.1-9. Notes on the life history, habits, description and character of injury of Trachykele blondeli Mars., an important enemy of western red cedar.

FRACKER,S.B. and Airplane Dusting to Control the Hemlock Spanworm; Jour. GRANOVSKY, A.A. For., Jan.1928, pp.12-33. A full report on the life history of the insect Elloptia fiscellaria Guenee and control measures as carried out in Peninsula State Park, Door County, Wisconsin.

HOPPING, R. Some Notes on Examination of Types of Coleoptera in the Leconte and Casey Collections; Can.Ent., Jan.1928, pp.6-8. List of Scarabaeidae, Cerambycidae and Anobiidae, as determined by the writer.

HOSLEY, W.W. Red Squirrel Damage to Coniferous Plantations and Its Relation to Changing Food Habits; Ecology, Jan.1928, pp.43-48, pl.V.

KNULL, J.N. Two New Cerambycidae (Coleop.); Ent. News, Jan.1928, pp.11-13. Descriptions of Elaphidion (Anoplium) masoni and Oberea elongata.

RYAN, H.J. Juniper Webworm, Dichomeris marginella Fabr., Infestation in Los Angeles Apparently Eradicated; Month.Bul. Dept.Agr.State of Calif., Jan.1928, pp.17-19, fig.5. Life history, habits, description of this species, introduced from Europe; severe infestation of Irish juniper near Los Angeles eradicated by destruction of infested trees.

STRICKLAND, E.H. Can Birds Hold Injurious Insects in Check? Scientific Monthly, Jan.1928, pp.48-56. It is improbable that in the case of the vast majority of plant-feeding insects, birds are a factor of much importance in reducing their population.